

CLAIMS

2 Having described the invention, what is claimed is as follows:

1. A portable remote swivel nozzle assembly with adjustable spray orientation for
4 spraying pressurized fluids, comprising:
a portable extension pole with a proximal end and a distal end,
6 a swivel nozzle including a base connected to the pole distal end at a swivel
nozzle base connector and a head swivelly connected to the base, the swivel
8 nozzle having a through passageway between the pole distal end and a
discharge orifice in the head,
10 an actuator on the extension pole,
wherein the actuator and the swivel nozzle head are mechanically linked to
12 communicate movement of the actuator to the head in adjusting orientation of
the head relative to the base.
14
2. The apparatus of claim 1 wherein the actuator comprises a hand grip slidable on
16 the pole, adjusting orientation of the head as the hand grip slides on the pole.
- 18 3. The apparatus of claim 2 wherein the hand grip is adapted as a pole hold, suitable
for an operator to brace the pole with a first hand while the operator's other hand
20 operates a trigger.

- 2 4. The apparatus of claim 1 wherein the actuator comprises a pole arm mounted
such that pivoting of the pole arm causes the head to rotate.
- 4
- 6 5. The apparatus of claim 1 wherein the actuator comprises a pole arm as a handle
grip mounted at a fixed position on the pole and rotatable on an axis transverse to
the pole and mechanically connecting to the head such that rotation of the handle
8 grip on its axis causes the head to rotate.
- 10 6. The apparatus of claim 1 wherein the pole is tubular with a pole passageway
therethrough as a fluid conduit between a pole connector on the pole proximal end
12 and a nozzle connector on the pole distal end.
- 14 7. The apparatus of claim 1 further comprising a lever attached to the head
extending outward therefrom to which a rod is attached connecting the actuator to
16 the head, the lever positioned relative to the head such that the head is directed
mostly forward when the actuator is fully extended, and directed away from
18 forward when the actuator is fully withdrawn.
- 20 8. The apparatus of claim 7 wherein the head rotates on the base with minimal
friction therein accommodating quick and facile remote adjustment of head
22 orientation, the lever connected through the rod to the adjustable actuator on the

pole maintaining the head properly oriented during high pressure fluid discharge
from the head in opposition to reaction forces from the discharge of the fluid.

9. The apparatus of claim 7 wherein the swivel nozzle further comprises
a manifold providing fluid connection between the base and the head, the head
firmly connected to the manifold and the base swivelly connected to the
manifold each with a fluid seal and having a manifold passageway through the
manifold continuing fluid communication between the base connector and the
discharge orifice in the head,
and the manifold includes a cylindrical surface between the base and the head
passing through a hole in the lever, the head further comprising a lug
extending from the head toward the base with a flat presented toward and
engaging the lever flat such that when the lever is rotated, the lever flat
engages the head flat which causes the head and manifold to rotate, therein
adjusting orientation of the head relative to the base.

10. The apparatus of claim 1 wherein the swivel nozzle further includes a manifold
providing fluid connection between the base and the head, the head connected to
the manifold and the base swivelly connected to the manifold each with a fluid
seal and having a manifold passageway axially through the manifold continuing
fluid communication between the base connector and the discharge orifice in the
head.

11. The apparatus of claim 10 further comprising seals contained within the swivel
2 nozzle sealing the swivel nozzle from fluid leaks, the seals being within the
swivel nozzle protecting the seals from damage during use.
- 4
12. The apparatus of claim 10 wherein the manifold is integrated into the head as a
6 single unit with no relative movement between them.
- 8
13. The apparatus of claim 10 wherein the head is adjustable approximately 180
degrees relative to the pole by action of the actuator.
- 10
14. The apparatus of claim 10 in which the head is spaced apart from of the base with
12 a continuous air gap between all base and head opposing surfaces in eliminating
frictional engagement between them.
- 14
15. The apparatus of claim 10 further comprising
16 a bolt with a head, the bolt threaded into matching threads in the manifold
passageway at its head end,
18 upper and lower O-rings spaced apart around the manifold,
wherein the base further includes a base bore perpendicular to a base axis running
20 longitudinally with the base with a base passageway between the base bore
and a base entry orifice,
22 and wherein the manifold further comprises a manifold upper passageway radial
from a manifold axis that runs longitudinally with the manifold, and a

manifold upper circumferential groove intersecting the manifold upper
2 passageway between the upper and lower O-rings and coplanar with the base
passageway therein providing fluid communication between the base entry
4 orifice through the base passageway to the manifold upper circumferential
groove and then to the manifold axial passageway, the O-rings establishing a
6 fluid seal between the base and the manifold such that fluid from the base
entry orifice flows only into the manifold axial passageway.

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16. The apparatus of claim 15 in which the base has upper and lower recesses opening
10 upward and downward, respectively, outward from the base and forming upper
and lower shoulders around the base bore, the O-rings positioned on the upper and
12 lower shoulders respectively, and wherein the manifold includes an annular shelf
circumferential about the manifold and intermediate its length, the upper O-ring
14 compressed between the bolt head and the upper shoulder and the lower O-ring
compressed between the annular shelf and the lower shoulder as the bolt tightens
16 into the manifold pulling the manifold shelf and the bolt head together on
opposite sides of the base.

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17. The apparatus of claim 16 in which the lower recess and annular shelf are sized
20 such that the shelf fits inside the lower recess when the bolt is tightened.

22 18. The apparatus of claim 15

wherein the head further includes a head bore perpendicular to a head axis
2 running longitudinally with the head with a head passageway between the
head bore and a head discharge orifice,
4 and wherein the manifold further comprises a manifold lower passageway radial
from the manifold axis and in fluid communication with the head passageway
6 therein providing fluid communication between the base entry orifice and the
head discharge orifice.

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19. A remote portable spray nozzle with adjustable spray orientation for spraying
10 pressurized fluids, comprising:
a portable extension pole with a proximal end and a nozzle connector on a distal
12 end to which pressurized fluid is delivered wherein the pole is tubular with a
pole passageway therethrough as a fluid conduit between a pole connector on
14 the pole proximal end and the nozzle connector on the pole distal end,
a swivel nozzle including
16 upper and lower O-rings,
a base connected to the nozzle connector and having a base bore perpendicular
18 to a base axis running longitudinally with the base with a base passageway
between the base bore and a base entry orifice,
20 a manifold swivelly connected to the base and having an axis that runs
longitudinally with the manifold and an axial passageway axially through
22 the manifold, a manifold upper passageway radial from the manifold axis,
and a manifold upper circumferential groove intersecting the manifold

upper passageway between the upper and lower O-rings spaced apart
2 around the manifold and coplanar with the base passageway therein
providing fluid communication between the base entry orifice through the
4 base passageway to the manifold upper circumferential groove and then to
the manifold axial passageway, the O-rings establishing a fluid seal
6 between the base and the manifold such that fluid from the base entry
orifice flows only into the manifold axial passageway, the manifold
8 further having a manifold lower passageway radial from the manifold axis,
a head with a head axis that runs longitudinally with the head and having a
10 head bore perpendicular to the head axis receiving a portion of the
manifold and a head passageway between the head bore and a head
12 discharge orifice, the manifold lower passageway being in fluid
communication with the head passageway, the manifold thus providing
14 fluid connection between the base connector in the base and the discharge
orifice in the head, with a fluid seal preventing fluid leakage between the
16 manifold and the head, the head being spaced apart from the base with a
continuous air gap between all base and head opposing surfaces in
18 eliminating frictional engagement between them,
an actuator on the extension pole comprising a hand grip slidable on the pole near
20 the pole proximal end, adapted to adjust orientation of the head as the hand
grip slides on the pole,
22 a rod between the actuator and the swivel nozzle head adapted to communicate
movement of the actuator to the head in adjusting orientation of the head

relative to the base, the head being adjustable approximately 180 degrees
2 relative to the base by action of the actuator,
a lever attached to the head extending outward therefrom to which the rod is
4 attached connecting the actuator to the head, the lever positioned relative to
the head such that the head is directed mostly forward, or in near alignment
6 with the pole, when the actuator is fully extended, and directed mostly
rearward, or in near counteralignment with the pole, when the actuator is fully
8 withdrawn wherein the head rotates on the base with minimal friction adapted
to accommodate quick and facile remote adjustment of head orientation, the
10 lever connected through the rod to the adjustable actuator on the pole
maintaining the head properly oriented during high pressure fluid discharge
12 from the head,
seals contained within the swivel nozzle sealing the swivel nozzle from fluid leaks
14 between the base and the manifold, the seals being within the swivel nozzle to
protect them from damage during use.

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20. The apparatus of claim 19 further comprising
18 a bolt with a head, the bolt threaded into matching threads in the manifold
passageway at its head end,
20 the base further having upper and lower recesses opening upward and downward,
respectively, outward from the base and forming upper and lower shoulders
22 around the base bore, the O-rings positioned on the upper and lower shoulders
respectively, and wherein the manifold includes an annular shelf

circumferential about the manifold and intermediate its length, the upper O-
2 ring compressed between the bolt head and the upper shoulder and the lower
O-ring compressed between the annular shelf and the lower shoulder as the
4 bolt tightens into the manifold pulling the manifold shelf and the bolt head
together on opposite sides of the head, the lower recess and annular shelf sized
6 such that the shelf fits inside the lower recess when the bolt is tightened.

8 21. A swivel nozzle useful on attachment to an extension pole, comprising
a base with a base axis running longitudinally with the base and having a bore
10 therethrough perpendicular to the base axis and a passageway parallel to the
axis between the bore and an entry orifice,
12 a base connector on the base at the entry orifice adapted to connect the base to a
conduit providing pressurized fluid to the base through the entry orifice,
14 a head swivelly connected to the base and having a through passageway between
the base connector and a discharge orifice in the head, all base and head
16 opposing surfaces spaced apart by a continuous air gap between them therein
eliminating frictional engagement between said opposing surfaces.

18 22. The swivel nozzle of claim 21 further comprising a manifold providing fluid
connection between the base and the head, the head connected to the manifold and
20 the base swivelly connected to the manifold each with a fluid seal and having a
manifold passageway through the manifold continuing fluid communication
22 between the base connector and the discharge orifice in the head.

23. The swivel nozzle of claim 21 wherein the head further comprises a manifold
2 portion extending therefrom and into the base bore providing fluid connection
between the base and the head and having a manifold passageway through the
4 manifold portion contributing to fluid communication between the base connector
and the discharge orifice in the head
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24. The swivel nozzle of claim 22 wherein the manifold is connected swivelly to the
8 base with a fluid seal therebetween.
- 10 25. The swivel nozzle of claim 24 wherein the fluid seal is between the base and the
manifold within the base bore.
12
26. The apparatus of claim 21 further comprising said fluid seal inside the swivel
14 nozzle with no external exposure, the seals thus protected from damage during
use.
16
27. The apparatus of claim 26 wherein swivel nozzle seals are exclusively inside the
18 swivel nozzle within the base bore.
- 20 28. The apparatus of claim 22 wherein the manifold is integrated into the head
precluding relative movement between the head and the manifold.
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29. The apparatus of claim 21 wherein the head is adjustable through a full 360-
2 degree revolution relative to the base.

4 30. The apparatus of claim 22 wherein the manifold is the exclusive interface between
the base and the head.

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31. The apparatus of claim 22 further comprising

8 a bolt with a head, the bolt threaded into matching threads in the manifold at its
head end,

10 upper and lower O-rings engaging the manifold spaced apart around its
circumference,

12 and wherein the manifold further comprises a manifold upper passageway radial
from a manifold axis, which manifold axis runs longitudinally with the
14 manifold, and a manifold upper circumferential groove intersecting the
manifold upper passageway between the upper and lower O-rings and in fluid
16 communication with the base passageway therein providing fluid
communication between the base entry orifice through the base passageway to
18 the manifold upper circumferential groove and then to the manifold axial
passageway, the O-rings establishing a fluid seal between the base and the
20 manifold such that fluid from the base entry orifice flows only into the
manifold axial passageway.

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2 32. The apparatus of claim 31 in which the base has upper and lower recesses opening
upward and downward, respectively, outward from the base and forming upper
and lower shoulders around the base bore, the O-rings positioned on the upper and
4 lower shoulders respectively, and wherein the manifold includes an annular shelf
circumferential about the manifold and intermediate its length, the upper O-ring
6 compressed between the bolt head and the upper shoulder and the lower O-ring
compressed between the annular shelf and the lower shoulder as the bolt tightens
8 into the manifold pulling the manifold shelf and the bolt head together on
opposite sides of the head.

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33. The apparatus of claim 32 in which the lower recess and annular shelf are sized
12 such that the shelf fits inside the lower recess when the bolt is tightened.

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34. The apparatus of claim 32 wherein the manifold is cylindrical of a constant
16 diameter modified therefrom only by the manifold upper circumferential groove
and the annular shelf.

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35. The apparatus of claim 31
20 wherein the head further includes a head bore perpendicular to a head axis
running longitudinally with the head with a head passageway between the
22 head bore and a head discharge orifice,

and wherein the manifold further comprises a manifold lower passageway radial
2 from the manifold axis and in fluid communication with the head passageway
therein providing fluid communication between the base entry orifice and the
4 head discharge orifice.

6 36. A swivel nozzle useful on attachment to an extension pole for spraying
pressurized fluids, comprising
8 a base having a base bore perpendicular to a base axis running longitudinally with
the base with a base passageway between the base bore and a base entry
10 orifice,
a base connector on the base at the entry orifice adapted to connect the base to a
12 conduit providing pressurized fluid to the base through the entry orifice,
upper and lower O-rings,
14 a manifold swivelly connected to the base and having an axis that runs
longitudinally with the manifold and an axial passageway axially through the
16 manifold, a manifold upper passageway radial from the manifold axis, and a
manifold upper circumferential groove intersecting the manifold upper
18 passageway between the upper and lower O-rings spaced apart around the
manifold and in fluid communication with the base passageway therein
20 providing fluid communication between the base entry orifice through the
base passageway to the manifold upper circumferential groove and then to the
22 manifold axial passageway, the O-rings establishing a fluid seal between the
base and the manifold such that fluid from the base entry orifice flows only

into the manifold axial passageway, the manifold further having a manifold
2 lower passageway radial from the manifold axis, the O-rings being within the
swivel nozzle to protect them from damage during use,
4 a head with a head axis that runs longitudinally with the head and having a head
bore perpendicular to the head axis receiving a portion of the manifold and a
6 head passageway between the head bore and a head discharge orifice, the
manifold lower passageway being in fluid communication with the head
8 passageway, the manifold thus providing fluid connection between the base
connector in the base and the discharge orifice in the head, with a fluid seal
10 preventing fluid leakage between the manifold and the head, the head being
spaced apart from the base with a continuous air gap between all base and
12 head opposing surfaces in eliminating frictional engagement between them.

14 37. The apparatus of claim 36 further comprising
a bolt with a head, the bolt threaded into matching threads in the manifold at its
16 head end,
and in which the base has upper and lower recesses opening upward and
18 downward, respectively, outward from the base and forming upper and lower
shoulders around the base bore, the O-rings positioned on the upper and lower
20 shoulders respectively, and wherein the manifold includes an annular shelf
circumferential about the manifold and intermediate its length, the upper O-
22 ring compressed between the bolt head and the upper shoulder and the lower
O-ring compressed between the annular shelf and the lower shoulder as the

bolt tightens into the manifold pulling the manifold shelf and the bolt head
2 together on opposite sides of the head, the lower recess and annular shelf are
sized such that the shelf fits inside the lower recess when the bolt is tightened,
4 wherein compression of the O-rings is adjusted by the bolt threading into the
manifold.
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